Mental Health Effects of Same-Sex Marriage Legalization WEB-APPENDICES

Appendix A: Details on Our Data

A1. Survey Questions

In 2001 part of questions in the POLS-survey changed, which makes it not easy to directly compare the information up to year 2001 to that from 2001 onward. Here is how we handled this.

Depression and Anxiety

- Depression

    1. Up to 2001: "In the past weeks did you feel depressed?" The answers are categorized into "(1) not at all, (2) sometimes, (3) often, and (4) very often".
    2. From 2001: "In the past 4 weeks did you feel so down in the dumps that nothing could cheer you up?" The answers are "(1) never, (2) rarely, (3) sometimes, (4) often, (5) usually, and (6) constantly.

    The original responses are first re-scaled to the range $[0, 1]$ and then standardized to have a mean of zero and a standard deviation of one for the pre-2001 period and for the period from 2001 onward, respectively. *Depression* is a variable combining the standardized responses of the two periods.

- Anxiety

    1. Up to 2001: "In the past weeks did you feel upset?" The answers are classified into "(1) not at all, (2) sometimes, (3) often, and (4) very often".
    2. From 2001: "For at least two weeks did you feel anxious or worried?" The answers are "(1) yes, and (2) no".

    The original responses are first re-scaled to the range $[0, 1]$ and then standardized to have a mean of zero and a standard deviation of one for the pre-2001 period and for the period from 2001 onward, respectively. *Anxiety* is a variable combining the standardized responses of the two periods.

Other Mental Health Related Variables

- Prevalence of depression: a dummy variable with value 0 if the answer to the question on depression is (1) and a value of 1 otherwise.
- Prevalence of anxiety

    1. Up to 2001: a dummy variable with value 0 if the answer to the question on anxiety is (1) and value 1 otherwise.

2. From 2001: a dummy variable with value 0 if the answer to the question on anxiety is (2) and value 1 otherwise.

- Feeling nervous

1. Up to 2001: "In the past weeks did you feel restless ?" The answers are "(1) not at all, (2) sometimes, (3) often, and (4) very often".
2. From 2001: "In the past 4 weeks did you feel very nervous?" The answers are"(1) never, (2) rarely, (3) sometimes, (4) often, (5) usually, and (6) constantly".

The original responses are first re-scaled to the range $[0, 1]$ and then standardized to have a mean of zero and a standard deviation of one for the pre-2001 period and for the phase including and after 2001, respectively. *Feeling nervous* is a variable combining the standardized responses of the two periods.

- Feeling empty

This variable is asked consistently over time: "Do you feel empty at the end of the working day?" The answers are categorized into "(1) never, (2) several times a year, (3) monthly, (4) a few times a month, (5) every week, (6) a few times a week, and (7) everyday". *Feeling empty* is a variable with the original response categories.

- Use of sleeping pills

There are two questions about use of sleeping pills: one is on prescription and the other is not, both with answers of "(1) yes, and (2) no". *Sleeping pills* is a dummy variable with value 0 if the answer is (2) to both questions and value 1 otherwise.

Health behavior

- Heavy drinking

This variable is asked consistently over time: "Do you drink more than 6 glasses of alcohol at least one day per week?" The answers are categorized into "(1) yes, and (2) no". *Heavy drinking* is a dummy variable with value 0 if the answer is (2) and value 1 otherwise.

- Drinking

1. Up to 2001: "Do you use alcoholic drinks?" The answers are classified into "(1) yes, and (2) no". *Drinking* is a dummy variable with value 0 if the answer is (2) and value 1 otherwise.
2. From 2001: Two relevant questions "Do you sometimes drink alcohol on weekdays?" and "Do you sometimes drink alcohol on weekend?" The answers are "(1) yes, and (2) no" to both questions. *Drinking* is a dummy variable with value 0 if the answer is (2) to both questions and value 1 otherwise.

- Smoking

  This variable is asked consistently over time: "Do you smoke?" The answers changed in 2001

  1. Up to 2001: "(1) yes, and (2) no". *Smoking* is a dummy variable with value 0 if the answer is (2) and value 1 otherwise.
  2. From 2001: "(1) smoke, (2) smoke sometimes, and (3) do not smoke". *Smoking* is a dummy variable with value 0 if the answer is (3) and value 1 otherwise.

Sexual behavior

- Sexual partners

  This variable is asked consistently over time: "In the past 12 months how many sexual partners did you have?" The answers are categorized as "(1) none, (2) one, (3) two, (4) three to five, (5) six or more". *Sex partner* is a dummy variable with value 0 if the answer is (1) and value 1 otherwise. *Multiple sex partner* is a dummy variable with value 0 if the answer is (1) or (2) and value 1 otherwise.

- Sexually transmitted infections

  This variable is asked consistently over time: "Are you diagnosed with the following diseases: gonorrhea, syphilis, chlamydia, genital herpes, genital warts, hepatitis B?" The answers to each of these diseases are "(1) yes, and (2) no". *STI* is a dummy variable with value 0 if the answer is (2) to all the above mentioned diseases and value 1 otherwise.

A2. Definition of Variables

Variable	Definition
Depression	Severity of depression; standardized score
Anxiety	Severity of anxiety; standardized score
Prevalence of depression	Dummy variable if being depressed
Prevalence of anxiety	Dummy variable if being anxious
Feeling nervous	Severity of nervous feeling; standardized score
Feeling empty	Dummy variable if feeling empty at the end of the working day
Use of sleeping pills	Dummy variable if use of sleeping pills
Heavy drinking	Dummy variable if consuming alcohol heavily
Drinking	Dummy variable if drinking alcohol
Smoking	Dummy variable if smoking
Sex partner	Dummy variable if having sexual partner(s) in the past 12 months
Multi sex partners	Dummy variable if having more than one sexual partners in the past 12 months
STI	Dummy variable if diagnozed with sexually transmitted infections
SSML	Dummy variable for the period after same-sex marriage legalization
Heterosexual	Dummy variable if having only different-sex partnership(s)
Same-sex	Dummy variable if having same-sex partnership(s)
Female	Dummy variable if female
Age	Age when surveyed
Never married	Dummy variable if never married
Married	Dummy variable if married or register partnered
Divorced	Dummy variable if divorced
Widowed	Dummy variable if widowed
Non-Dutch	Dummy variable if not a Dutch citizen
Employed	Dummy variable if employed
Primary school	Dummy variable if highest completed education is primary school
Secondary school	Dummy variable if highest completed education is secondary school
Vocational school	Dummy variable if highest completed education is vocational school
Applied college	Dummy variable if highest completed education is applied college
University	Dummy variable if highest completed education is university
Non-urban	Dummy variable if residing in a non-urban place
Little urban	Dummy variable if residing in place with a little urban degree
Medium urban	Dummy variable if residing in place with a medium urban degree
Strongly urban	Dummy variable if residing in place with a strongly urban degree
Very strongly urban	Dummy variable if residing in place with a very strongly urban degree

A3. Descriptives

Variable	Different-sex	Same-sex	All
Depression	-0.010	0.131	0.003
Anxiety	0.026	0.084	0.032
Prevalence of depression	0.382	0.425	0.386
Prevalence of anxiety	0.288	0.308	0.290
Feeling nervous	-0.005	0.168	0.010
Feeling empty	2.424	2.564	2.436
Use sleeping pills	0.036	0.039	0.036
Heavy drinking	0.133	0.184	0.138
Drinking	0.934	0.949	0.935
Smoking	0.320	0.385	0.326
Sex partner	0.953	0.856	0.946
Multi sex partners	0.034	0.201	0.046
STI	0.045	0.100	0.049
SSML	0.692	0.752	0.697
Age/10	3.813	2.995	3.739
Never married	0.286	0.754	0.329
Married	0.655	0.173	0.611
Divorced	0.053	0.069	0.054
Widowed	0.006	0.004	0.006
Non-Dutch	0.024	0.043	0.026
Employed	0.830	0.800	0.828
Primary school	0.090	0.085	0.089
Secondary school	0.146	0.091	0.141
Vocational school	0.097	0.135	0.100
Applied college	0.416	0.351	0.410
University	0.251	0.339	0.259
Non-urban	0.170	0.081	0.162
Little urban	0.247	0.152	0.238
Medium urban	0.218	0.165	0.213
Strongly urban	0.256	0.309	0.261
Very strongly urban	0.110	0.292	0.127
Observations	36,915	3,671	40,586

Note: the averages of the standardized measures (Depression, Anxiety, Feeling nervous) in the last column are close to but not strictly zero since the statistics shown in the above table are for the estimation sample excluding individuals older than 55 while the standardization is based on the full sample.

Appendix B: Full Parameter Estimates

In Table B1, we present the full parameter estimates related to our baseline estimates presented in the main text in Table 3.

Table B1: Full parameter estimates

	Depression		Anxiety	
Same-sex (γ_1)	0.177	(0.039)***	0.270	(0.041)***
SSML (γ_2)	-0.006	(0.044)	0.068	(0.044)
Same-sex×SSML (δ)	-0.089	(0.044)**	-0.235	(0.045)***
Female	0.165	(0.010)***	0.312	(0.010)***
Age/10	0.197	(0.035)***	0.276	(0.035)***
Age squared/100	-0.022	(0.005)***	-0.027	(0.005)***
Married	-0.113	(0.015)***	-0.083	(0.015)***
Divorced	0.270	(0.030)***	0.190	(0.028)***
Widowed	0.195	(0.077)**	0.115	(0.072)
Non-Dutch	0.150	(0.038)***	0.022	(0.034)
Employed	-0.289	(0.016)***	-0.142	(0.015)***
Secondary school	-0.148	(0.025)***	-0.031	(0.022)
Vocational school	-0.181	(0.026)***	-0.029	(0.024)
Applied college	-0.202	(0.022)***	0.010	(0.020)
University	-0.276	(0.023)***	-0.010	(0.021)
Little urban	-0.003	(0.015)	0.027	(0.016)*
Medium urban	0.041	(0.015)***	0.039	(0.016)**
Strongly urban	0.083	(0.015)***	0.079	(0.016)***
Very strongly urban	0.093	(0.019)***	0.064	(0.019)***
1999	0.034	(0.022)	0.041	(0.023)*
2000	0.030	(0.022)	0.056	(0.023)**
2001	0.023	(0.041)	0.006	(0.041)
2002	-0.020	(0.050)	-0.067	(0.050)
2003	-0.038	(0.049)	-0.055	(0.049)
2004	-0.001	(0.049)	-0.067	(0.049)
2005	-0.012	(0.049)	-0.076	(0.049)
2006	-0.072	(0.050)	-0.120	(0.050)**
2007	-0.042	(0.049)	-0.143	(0.050)***
2008	-0.062	(0.049)	-0.120	(0.050)**
February	0.008	(0.023)	-0.040	(0.024)*
March	0.014	(0.023)	-0.027	(0.023)
April	0.014	(0.024)	0.003	(0.024)
May	0.013	(0.023)	-0.011	(0.024)
June	0.006	(0.024)	-0.011	(0.024)
July	-0.011	(0.024)	-0.024	(0.025)
August	-0.048	(0.024)**	-0.008	(0.025)
September	0.003	(0.024)	0.016	(0.025)
October	-0.004	(0.024)	-0.021	(0.025)
November	0.009	(0.023)	-0.018	(0.023)
December	0.024	(0.025)	-0.031	(0.025)
Constant	-0.039	(0.065)	-0.625	(0.064)***

Note: Based on 40,586 observations; * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.
Robust standard errors in parentheses.

Appendix C: Additional Analyses

C1. Heterogeneity Investigation

The effects of SSML may not be homogeneous across the board. Mental health of some specific sub-groups in sexual minorities may be especially impacted by the legalization. We investigate the heterogeneous effects in terms of gender, urbanization of respondents' residence, age, employment status and educational attainment. This exploration may help us to understand how the improvement in societal attitudes to sexual minorities owing to the legislation exerted influence on their mental health. For parsimony Table C1 only shows our main parameters of interest, i.e. the coefficient of $Same\text{-}sex \times SSML$. Panel a reproduces the baseline estimates for ease of comparison. The downside of splitting up our sample in various dimensions is the reduction in the number of observations and thus the decline in the statistical significance.

Table C1: Parameter estimates effects of same-sex marriage legalization on mental health; heterogeneity by subgroups

	Depression		Anxiety		No. obs
a. Baseline	-0.089	(0.044)**	-0.235	(0.045)***	40,586
b. Gender					
Men	-0.061	(0.058)	-0.194	(0.056)***	19,069
Women	-0.166	(0.066)**	-0.282	(0.072)***	21,517
c. Degree of ubanization					
Low	-0.146	(0.066)**	-0.244	(0.069)***	24,857
High	-0.048	(0.059)	-0.231	(0.060)***	15,729
d. Age					
Young (16-30)	-0.129	(0.057)**	-0.171	(0.059)***	11,454
Middle aged (31-55)	0.024	(0.071)	-0.114	(0.071)	29,132
Older (56-90)	-0.049	(0.148)	-0.017	(0.135)	16,109
Extended sample (16-90)	-0.128	(0.042)***	-0.256	(0.042)***	56,695
e. Labor market status					
Employed	-0.088	(0.047)*	-0.231	(0.048)***	33,589
Non-employed	-0.135	(0.108)	-0.281	(0.112)**	6,997
f. Educational attainment					
No college degree	-0.050	(0.081)	-0.217	(0.077)***	13,420
College degree	-0.098	(0.052)*	-0.238	(0.055)***	27,166

Note: Only parameter estimates of Same-sex×SSML are presented in the table for parsimony and the ease of comparison; see also footnote Table B1.

Panel b of Table C1 displays the estimates separately by gender. Although there are differences in magnitude or significance, the results are qualitatively similar to the baseline in panel a. The SSML effects are more significant both statistically and economically for lesbian women than gay men. Even for the insignificant effect, the point estimate is in the same direction as for the pooled estimate. Post-SSML, both mental health indicators of lesbian women significantly approached those of heterosexual women. The same holds

among men for anxiety.

Usually big cities have a more friendly environment to sexual minorities. Since people in urban regions had been already more tolerant for sexual minorities pre-SSML, this legislation might not further improve the attitudes to them in urban areas as much as in non-urban regions. However, it could also be that tolerant cities positively responded to a larger extent to the legalization than the conservative countryside. Therefore, the improvements in attitudes and thus in mental health of sexual minorities could be either bigger or smaller in urban regions than in non-urban ones. Panel c presents estimates in less urban areas and highly urban regions, respectively. The legalization of SSM significantly diminished depression and anxiety in a larger scale for sexual minorities in low urban areas than in higher urban ones. Thus the results seem more inclined to support the first hypothesis: SSML benefited mental health of sexual minorities more in rural areas than in highly urban places where the vibe had been already more friendly to sexual minorities pre-legalization.

Panel d distinguishes individuals among three age cohorts: the young (16 to 30 years old), the middle aged (31 to 55 years old), and the older (56 to 90 years old). The legalization benefited mental health of younger sexual minorities more than older ones. Moreover, we conduct a sensitivity analysis with an extended age sample in the last row of panel d. This sample includes individuals older than 55 who were excluded in the baseline analysis. The estimated sexual orientation gaps in mental health pre-SSML (i.e. the coefficients of *Same-sex* not reported here) are similar to the baseline ones but the estimated effects of SSML for sexual minorities are stronger and more significant.

The differences between the employed and the non-employed are presented in panel e. Non-employment could mean unemployment or not being in the labor force because of either still receiving education or quitting the labor force. Mental health improved after SSML more substantially among the non-employed though the effect on depression is insignificant.

Finally, in panel f of Table C1 we show divergent mental health effects of SSML between college degree holders and individuals without a college degree. College here refers to either the applied college or the research university. The mental health effects of SSML are stronger for individuals with a college degree than those without a college degree.

All in all, after examining a variety of heterogeneities, we find that SSML diminished the sexual orientation gaps of mental health more successfully among women, residents in low urban regions, younger people and college degree holders. It could be because com-

munities surrounding these groups reacted more positively to the legislation by improving their attitudes to sexual minorities, or because these groups responded more actively to the legalization perceiving themselves as more accepted by society.

C2. Sensitivity Analyses

To investigate the robustness of our main findings we perform a range of sensitivity analyses. First, we add to our model sexual orientation-specific time trends which are capable to capture potential divergent preexisting trends. Second, we implement additional analyses with an extended estimation sample including individuals with unidentified sexual orientation. Third, we exclude possible bad controls which may be influenced by SSML such as marital status and employment status. Then we interact SSML with individual covariates to account for potential responses of these characteristics to the legislation. Furthermore, to avoid potential selection into sexual minorities triggered by the legalization, we remove individuals who started their first same-sex partnership after SSML. Finally, we conduct falsification tests by exploiting counterfactual timings for SSML. Relevant estimates are displayed in Table C2.

Table C2: Sensitivity analysis – parameter estimates effect of SSML on mental health

	Depression		Anxiety		No. obs
a. Baseline	-0.089	(0.044)**	-0.235	(0.045)***	40,586
b. Group specific trends					
Same-sex×Year 2001 post-2	-0.030	(0.103)	-0.222	(0.097)**	
Same-sex×Year 2003-4	-0.118	(0.145)	-0.214	(0.140)	40,586
Same-sex×Year 2005-6	-0.119	(0.202)	-0.251	(0.190)	
Same-sex×Year 2007-8	-0.170	(0.259)	-0.200	(0.247)	
c. Unknown sexual orientation					
Regarded as heterosexual	-0.089	(0.043)**	-0.231	(0.045)***	43,747
Regarded as sexual minority	-0.030	(0.032)	-0.133	(0.033)***	43,747
d. Excluding potential endogenous covariates	-0.104	(0.044)**	-0.245	(0.045)***	40,586
e. Interaction SSML and covariates	-0.084	(0.045)*	-0.121	(0.046)***	40,586
f. Excluding sexual minorities identified post-SSML	-0.098	(0.063)	-0.129	(0.063)**	38,489
g. Propensity score matching					
Nearest one neighbor	-0.212	(0.076)***	-0.287	(0.074)***	5,065
Nearest three neighbors	-0.124	(0.055)**	-0.241	(0.056)***	7,641
h. Placebo timing SSML					
January 2001	0.074	(0.183)	-0.003	(0.148)	12,288
January 2000	0.090	(0.079)	-0.002	(0.083)	12,288
January 1999	0.063	(0.079)	0.055	(0.082)	12,288

Note: see footnote Table B1.

Wolfers (2006) argues that a model may be misspecified by assuming an immediate constant response to a policy shock. Including group-specific time trends might exacer-

bate the resulting bias if the pre-shock period is considerably shorter than the post-shock one. Rather than estimating merely a constant post-policy effect, he suggests including dummy variables for the first two years of the new policy phase, for year three and four, five and six, etc. in addition to the group-specific time trends. In this way these time trends will be able to identify preexisting trends. Considering the short pre-legislation phase and adopting his idea, we establish the same model specification allowing for flexible response dynamics to the legislation and including sexual orientation-specific linear time trends. Panel b of Table C2 displays the estimates. After including the sexual orientation-specific time trends, the beneficial effect of SSML on depression escalated over time but it is not precisely estimated.[1] The effect on anxiety is close to the baseline and rather stable across years. Though significant only in the first two years following the legalization, the separate point estimates over time are virtually identical to one another.

In the baseline analysis, we excluded individuals whose sexual orientation cannot be identified. They did not form any (recorded) cohabitation, registered partnership or marriage during the whole period of the administrative data. They could be the young who had not established their first relationship or those that had been divorced or widowed since 1995. It is difficult to decide whether to categorize these unidentified people as heterosexuals or sexual minorities. We first provisionally regard them as heterosexuals simply because with respect to the mental health indicators they are more similar to heterosexuals. The first row in panel c reports estimates corresponding to such a classification. They are virtually identical to the baseline estimates in both magnitude and significance. Nonetheless, it could be also the case that these unidentified individuals were sexual minorities but they chose not to register any relationship with a same-sex partner. A caveat relevant to this speculation is that the proportion of sexual minorities would increase to 17% which is substantially higher than that in other studies using representative Dutch surveys, e.g. Buser et al. (2018) and Chen and van Ours (2018). Still, we show in the second row of panel c estimates based on such a categorization. The effects of SSML are qualitatively consistent with those in the baseline specification though the effect on depression loses the significance and the effect on anxiety declines considerably.

In the analyses so far we included possible bad control variables such as marital status

[1]The sizable but insignificant estimates of these interaction terms are owing to the dispersion across different post-SSML periods of sexual minorities whose sample size is limited. Nonetheless, we prefer to follow Wolfers (2006)'s suggestion and estimate the model in this way in order to mitigate the estimation bias. The estimates are not statistically significant, but they are not trivial in magnitude and are very persistent and consistent over time.

and labor supply which might change due to the legalization. In response, we take two measures: First, we simply exclude these covariates from the model. Second, we interact these covariates with the post-legislation phase. Panel d shows the results for the first method and panel e the second. The parameter estimates in panel d are rather similar to those in the baseline with a more sizeable effect on depression. In panel e, the effect on depression is virtually identical to the baseline but the effect on anxiety is almost halved though still highly significant.

Another potential issue of selectivity is related to the classification of part of sexual minorities. If SSML stimulated some sexual minorities to enter their first ever same-sex partnership and they had intrinsically divergent mental health, the assignment to treatment would be endogenous. To investigate how sensitive our main estimates are to this issue, we exclude from our sample individuals who established their first same-sex partnership post-legislation. Because of the removal of these sexual minorities, we lose more than half of our treatment group. This may affect the precision of the estimation. As shown in panel f, the effect on depression is not precisely estimated any more but the size becomes even larger than the baseline. The effect on anxiety reduces but still keeps significant at the 5% level.

Furthermore, to make individuals in the treatment and control groups even more comparable, we perform additional analyses with the propensity score matching in panel g. Only matched individuals from the treatment and control groups form our estimation sample. The first row shows the results with the nearest one neighbor matching and the second row displays the estimates with the nearest three neighbors matching. The beneficial effects of the legislation on mental health become more economically and statistically significant as more matched units are included in the sample. The conclusions from this matching method are consistent with the baseline estimates.

Last but not least, to establish a relationship between SSML and mental health, there must not have been other events responsible for the divergence of mental health between sexual minorities and heterosexuals occurring at a time close to the legalization. Placebo tests applying counterfactual timings of the reform in the pre-SSML period will provide such evidence if we do not find similar effects of the fake policy change to that of the real legislation. We use the pre-SSML sample to conduct such tests whose results are displayed in panel h of Table C2.[2] We introduce the onset of the counterfactual policy reform at the beginning of 2001 in the first row of panel g, at the beginning of 2000 in

[2]One might include the post-SSML sample for such falsification tests if one is interested in how the impact of SSML, if there was, would materialize in the post-SSML phase, i.e. immediately or gradually.

the second row and of 1999 in the third row. The placebo policy change did not exert a significant influence on mental health of sexual minorities.

C3. Effects of SSML on Other Health Relevant Variables

In addition to the effects of SSML on severity of depression and anxiety, we also examine the impacts of SSML on some other mental health related variables, health behaviors and sexual behavior. The relevant parameter estimates are shown in Table C3.

Table C3: Parameter estimates effects of same-sex marriage legalization on other health related variables

	Same-sex ×SSML	Obs.
a. Other mental health indicators		
Prevalence depression	-0.037*	40,586
Prevalence anxiety	-0.091***	40,586
Feeling nervous	-0.072*	40,586
Feeling empty	-0.140*	32,975
Use sleeping pills	-0.013*	40,586
b. Health behavior		
Heavy drinking	-0.026*	40,295
Drinking	-0.022*	40,295
Smoking	-0.018	40,586
c. Sexual behavior		
Sex partner	-0.029	2,729
Multi sex partners	-0.060	2,729
Diagnosed STI	0.003	2,706

Note: See footnote Table B1. The small numbers of observations in panel c are because of a large non-response and because survey questions on sexual behavior were not asked since 2002.

In the main analysis, the standardized measures of depression and anxiety represent the intensity of mental illnesses. The first two rows of panel a of Table C3 report estimates with binary measures of depression and anxiety. The binary measures indicate the prevalence, i.e. the proportion in the population who suffers depression and anxiety, respectively. Qualitatively similar to the baseline results, prevalence of depression diminished by 3.7 percentage points while prevalence of anxiety declined by 9.1 percentage points among sexual minorities after SSML. Thus we draw the same conclusions no matter whether we use intensity measures or prevalence indicators. The other rows of panel a show that at the 10% level SSML significantly reduced for sexual minorities nervousness, the frequency of empty feeling and the use of sleeping pills. Both feeling empty and the use of sleeping pills are based on questions that did not change over time. Clearly, the mental health effects documented with these unchanged measures are consistent with the effects on depression and anxiety in our baseline analysis. In other words, the measurement changes may not make a difference in determining the mental health effects of

SSML.

Panel b of Table C3 displays the effects on health behaviors of sexual minorities. The probability of (heavy) drinking significantly reduced by more than two percentage points after the legislation while the effect on smoking was insignificant.

In panel c regarding effects on sexual behavior, we adopt the following dummy variables: Sex partner, Multiple sex partners, and Sexually transmitted infections (diagnosed STI). None of the parameter estimates is significantly different from zero. Hence the legalization of SSM did not render sexual minorities more active or promiscuous in their sexual life.

C4. Registered Partnerships and Mental Health

In the baseline analysis we ignored the mental health effects of the introduction of RP. Here, we examine whether this policy reform in 1998 affected mental health of sexual minorities. Using the same empirical set-up as in the main analysis, we compare the variations in mental health of sexual minorities from 1997 to 1998 to those of heterosexuals. Table C4 reports the estimates of interest. Apparently the implementation of RP did not exert significant influence on depression or anxiety of sexual minorities.

Table C4: Parameter estimates effects of registered partnership introduction on mental health; 1997-1998

	Depression		Anxiety	
Same-sex (γ_1)	0.096	(0.058)*	0.143	(0.059)**
RP (γ_2)	0.028	(0.022)	0.007	(0.023)
Same-sex×RP (δ)	0.048	(0.085)	0.012	(0.087)

Note: Based on 8,486 observations; see also footnote Table B1.

References

Buser, T., L. Geijtenbeek, and E. Plug (2018). Sexual orientation, competitiveness and income. *Journal of Economic Behavior & Organization 151*, 191–198.

Chen, S. and J. C. van Ours (2018). Subjective well-being and partnership dynamics: Are same-sex relationships different? *Demography 55*(6), 2299–2320.

Wolfers, J. (2006). Did unilateral divorce laws raise divorce rates? A reconciliation and new results. *American Economic Review 96*(5), 1802–1820.